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APPENDICES

APPENDIX I

Components of energy free medium, energy supply medium, and PBS

(Freshney, 2000; Fu *et al.*, 2004)

Energy free medium

NaN ₃	97.5 mg
FBS	10 ml
PBS pH 7.4 qs. to	100 ml

Energy supply medium

Glucose	192 mg
FBS	10 ml
PBS pH 7.4 qs. to	100 ml

PBS (Duldecco's PBS A)

KCl	0.2 g
KH ₂ PO ₄	0.2 g
NaCl	8 g
Na ₂ HPO ₄	2.2 g
Ultra pure water qs. to	1000 ml
Adjust pH to 7.4	

APPENDIX II

Data

Table 14 Results MTT assay of RM 72-hours treatment in KB cell lines

RM concentration (ng/ml)	KB cells		
	% inhibition	SD	S.E.
0.03	-38.4825	3.497227	2.472913
0.122	-34.2284	2.314993	1.636947
1.95	-0.79957	8.354813	5.907745
7.81	97.72428	0.547959	0.316364
31.25	97.44313	0.361517	0.208722
125	98.14492	0.246958	0.142581
500	98.55201	0.101185	0.058419

Table 15 Results MTT assay of RM 72-hours treatment in H460 cell lines

RM concentration (ng/ml)	H460 cells		
	% inhibition	SD	S.E.
0.03	-6.7325	2.281478	1.613249
0.122	2.770522	1.950997	1.379563
0.48	9.483037	4.855007	3.433008
1.95	27.38493	1.583934	1.120011
7.81	93.56221	1.987104	0.993552
31.25	93.56221	1.276212	0.638106
125	94.08331	1.275101	0.63755
500	94.56975	1.142392	0.571196

Table 16 Results MTT assay of RM 72-hours treatment in CC2511 cell lines

RM concentration (ng/ml)	CC2511 cells		
	% inhibition	SD	S.E.
0.03	-7.75208	11.42014	5.710069
0.122	-5.92936	13.90634	6.95317
0.48	-3.99074	10.69546	5.347729
1.95	7.545034	9.920185	4.960092
7.81	42.25401	26.46179	13.23089
31.25	59.89969	19.54498	9.772489

Table 17 Results MTT assay of RM 72-hours treatment in LLC-PK₁ cell lines

RM conc. (ng/ml)	LLC-PK ₁				S.E.
	N1 (29/8/48)	N2 (1/9/48)	N3 (25/10/48)	%inhibition	
0.03	15.67291312	13.95592865	24.59173871	18.07353	3.300488
0.12	11.32879046	13.74606506	15.56195965	13.54561	1.227568
0.48	8.00681431	20.67156348	12.48799232	13.72212	3.712102
1.95	1.36286201	33.2633788	17.38712776	17.33779	9.219836
7.8	39.26746167	46.3798531	43.22766571	42.95833	2.060021
31.25	86.88245315	85.30954879	87.12776177	86.43992	0.57028
125	97.01873935	97.58656873	97.6945245	97.43328	0.209847
500	96.4028777	97.27177335	97.59846302	97.09104	0.357193
IC50 (ng/ml)	10.506	10.215	11.517	11.255	0.395014

Table 18 Results MTT assay of RM 72-hours treatment in LLC-MDR₁ cell lines

RM (ng/ml)	LLC-MDR ₁				S.E.
	N1(16/12/48)	N2(19/12/48)	N3(22/12/48)	%inhibition	
0.0076	10.90909091	-6.83229813	-26.5306122	-7.48461	10.82565
0.03	21.07438017	-2.75066548	-18.1898846	0.04461	11.434
0.12	25.61983471	3.549245785	-20.4081632	2.920306	13.30661
0.48	49.83471074	39.57409051	15.43921917	34.94934	10.20692
1.95	95.04132231	91.74800355	61.49068323	82.76	10.68973
7.8	95.45454545	95.91836735	90.59449867	93.98914	1.704611
31.25	97.10743802	97.42679681	98.58030169	97.70485	0.447861
125	96.7768595	97.95918367	98.58030169	97.77211	0.529572
IC50 (ng/ml)	0.55799	0.54559	0.94648	0.683353	0.131768

Table 19 Results LDH release assay of RM 24-hours treatment in LLC-PK₁ and LLC-MDR₁ cell lines

groups	LLC-PK ₁			LLC-MDR ₁		
	LDH	SD	S.E.	LDH	SD	S.E.
control	100	4.4725311	2.236266	100	13.487407	6.743704
RM 0.1 ng/ml	110.374	7.4129404	3.70647	258.6745	167.48984	83.74492
RM 1 ng/ml	109.8408	11.456236	5.728118	468.0762	388.78218	194.3911
RM 10 ng/ml	104.7493	8.0870821	4.043541	934.2696	189.06995	94.53498
RM 100 ng/ml	175.9531	33.383021	16.69151	1715.004	614.61479	307.3074

Table 20 Results MTT assay of RM 24-hours treatment in LLC-PK₁ and LLC-MDR₁ cell lines

groups	LLC-PK ₁			LLC-MDR ₁		
	%inhibition	SD	S.E.	%inhibition	SD	S.E.
control	2.202973	8.053974	4.02698	13.95058	2.993823	1.4969
RM 0.1 ng/ml	9.011691	10.39275	5.19637	23.41664	2.691538	1.3457
RM 1 ng/ml	9.906156	11.16616	5.58308	30.62417	2.928236	1.4641
RM 10 ng/ml	8.47909	13.14652	6.57326	71.87688	3.381936	1.6909
RM 100 ng/ml	20.99529	8.948725	4.47436	95.7914	8.544789	4.2723

Table 21 Results MTT assay of treatment VBL and VBL co-treatment with verapamil 72 hours in LLC-PK₁ cell lines

VBL concentration (ng/ml)	VBL		VBL+verapamil 20 μ M	
	%inhibition	S.E.	%inhibition	S.E.
0.0128	4.075022	3.829936	27.80950266	0.728549
0.064	3.014746	2.625753	35.22122818	1.115672
0.32	12.03165	7.329525	51.24335099	12.68574
1.6	51.38053	0.927099	73.63424384	4.356496
8	85.24677	0.644473	78.96455273	10.0748
40	88.45145	1.984105	82.15211023	6.575118
200	91.86645	0.474393	83.52566543	5.472298
1000	91.72669	0.347675	82.47213498	7.614586

Table 22 Results MTT assay of treatment VBL and VBL co-treatment with verapamil 72 hours in LLC-MDR₁ cell lines

VBL concentration (ng/ml)	VBL		VBL+verapamil 20 μ M	
	%inhibition	S.E.	%inhibition	S.E.
0.0128	-9.86451	2.580567	2.497486791	15.59847
0.064	0.538782	6.206352	6.336160346	10.16159
0.32	-0.72906	2.738094	19.84851998	13.3873
1.6	6.083309	3.197697	49.35877153	22.72314
8	68.5821	1.401067	84.24180104	4.882975
40	89.77997	0.423844	92.03311353	0.574912
200	94.84281	0.401052	92.01415362	0.889472
1000	95.28232	0.101989	90.35030816	1.470566

Table 23 Results MTT assay of pre-treatment with RM 24 hours prior treatment VBL 72 hours in LLC-PK₁ cell lines

VBL concentration (ng/ml)	RM 0.001 ng/ml	S.E.	RM 0.01 ng/ml	S.E.	RM 0.1 ng/ml	S.E.	VBL control	S.E.
0.0128	11.11435	10.46837	7.57355258	7.490551	12.22821339	8.782801	10.7479697	7.220582
0.064	10.43703	9.134644	9.83400697	9.549893	18.5728496	6.667603	11.2544474	9.774022
0.32	15.72754	15.94284	19.8351108	18.68552	16.47143814	13.95144	19.2943169	14.59706
1.6	51.24894	5.227539	51.1697123	5.461491	51.73406119	3.88939	50.1754525	0.357263
8	83.66569	2.432092	84.1371700	0.225912	83.36179455	1.648598	83.2808605	1.685098
40	87.96761	1.97759	86.8049058	1.674522	87.28811389	1.874915	87.1601106	1.627243
200	88.80849	1.016201	89.6700311	0.58665	89.86770448	0.597445	91.6645187	0.490834
1000	88.70397	1.985104	89.9863933	1.118113	89.87782663	0.071415	90.6463063	0.774039

Table 24 Results MTT assay of pre-treatment with RM 24 hours prior treatment VBL 72 hours when in LLC-MDR₁ cell lines

VBL concentration (ng/ml)	RM 0.001 ng/ml	S.E.	RM 0.01 ng/ml	S.E.	RM 0.1 ng/ml	S.E.	VBL control	S.E.
0.0128	-23.3227942	17.32764	-22.8749347	22.61605	-7.26293508	28.46306	-1.85523913	17.10559
0.064	-18.6846611	11.56662	-13.5225272	17.04896	-3.56098222	30.02804	4.792442497	18.36664
0.32	-11.5972674	13.57537	-9.25224272	13.60886	1.712452265	27.71316	14.26067908	29.18311
1.6	-11.8403232	20.14529	-0.63613703	18.5632	10.16163657	30.19343	25.21558963	29.76379
8	55.49543877	14.991	61.78961608	11.37217	62.50720457	16.6218	76.53577948	4.900962
40	82.55375443	9.069064	70.46191078	19.88917	87.69086322	3.194858	91.62230741	1.325413
200	93.74439722	1.696654	89.6640429	4.497994	92.97034647	0.195694	95.09437751	2.056873
1000	94.37464932	1.077688	94.34034742	0.734517	93.0823062	1.291686	95.12358525	0.74634

Table 25 Results MTT assay of co-treatment VBL and RM 72 hours in LLC-PK₁ cell lines

VBL concentration (ng/ml)	RM 0.001 ng/ml	S.E.	RM 0.01 ng/ml	S.E.	RM 0.1 ng/ml	S.E.	verapamil 20 mcM	S.E.	VBL control	S.E.
0.0128	13.17622695	4.840543	13.336848	8.541921	8.805053174	1.306995	27.80950266	0.728549	8.166344973	8.618945
0.064	15.11988843	1.813623	13.98508221	2.085145	15.15753547	5.869463	35.22122818	1.115672	13.14967538	7.685793
0.32	25.43983856	9.439589	25.91188179	11.88684	26.02371077	13.0426	51.24335099	12.68574	23.29005089	9.94328
1.6	40.85451443	8.095807	44.0750991	17.46217	43.33869841	9.705975	73.63424384	4.356496	54.84690297	5.838015
8	80.72026759	5.266184	80.46419201	6.277024	79.73003926	7.251147	78.96455273	10.0748	76.68801544	9.959651
40	84.25374151	7.870786	84.48210831	6.7606	81.1034818	10.07872	82.15211023	6.575118	82.91410774	9.114817
200	84.77755829	7.736024	84.40196342	8.737685	81.69305667	11.01841	83.52566543	5.472298	84.71398491	8.904147
1000	82.91264562	8.681633	82.73936513	9.737719	82.71132506	9.385582	82.47213498	7.614586	83.2997017	8.257058

Table 26 Results MTT assay of co-treatment VBL and RM 72 hours in LLC-MDR₁ cell lines

VBL concentration (ng/ml)	RM 0.001 ng/ml	S.E.	RM 0.01 ng/ml	S.E.	RM 0.1 ng/ml	S.E.	verapamil 20 uM	S.E.	VBL control	S.E.
0.0128	2.362340531	2.105022988	-4.68597225	4.451892	16.39641114	9.610918	2.497486791	15.59847	7.95762593	15.89442
0.064	5.710225158	2.114338127	7.470038655	0.797071	19.67915731	8.671876	6.336160346	10.16159	10.0325132	14.33658
0.32	9.556598349	5.960822272	9.543352655	3.517604	19.90164522	7.683035	19.84851998	13.3873	10.6613109	14.98598
1.6	15.36639054	5.820321417	21.25036946	2.937437	31.65297594	5.764405	49.35877153	22.72314	19.83862	15.57511
8	61.43974525	0.987096151	61.16996848	1.579314	64.99291556	2.175682	84.24180104	4.882975	69.121273	4.874657
40	85.18572818	1.910999427	86.76844864	1.392826	86.73976218	1.444814	92.03311353	0.574912	86.1200959	1.43792
200	94.1635749	0.253388365	93.95364314	0.425007	94.35603342	0.212078	92.01415362	0.889472	93.8911344	0.339127
1000	94.66769718	0.448417328	93.97323617	1.060589	94.56603143	0.578424	90.35030816	1.470566	93.2186459	0.479622

Table 27 Results MTT assay of co-treatment puromycin and RM 72 hours in LLC-MDR₁ cell lines

puromycin concentration (ng/ml)	control		RM 0.001 ng/ml		RM 0.01 ng/ml		verapamil 20 mcM	
	%inhibition	S.E.	%inhibition	S.E.	%inhibition	S.E.	%inhibition	S.E.
3.2	-18.436487	5.851757	-3.86809	0.326529	-2.1151536	2.592126	19.4634142	4.781845
16	-13.841749	3.459089	-6.9124934	2.476146	-7.6838314	0.730457	10.799506	7.232325
80	-4.9942996	4.288543	-8.311414	2.692418	-5.9746529	5.467564	19.358837	6.113267
400	91.5287216	2.109391	78.3903659	2.464445	76.8581245	0.671157	97.1756422	0.463851
2000	97.720482	1.058272	97.8794125	0.243153	97.7922012	0.250257	98.5747798	0.053316
10000	98.4413313	0.270714	97.151453	0.089399	97.2062681	0.062219	98.1567184	0.200543

Table 28 Results of RM on Rhodamine 123 accumulation in LLC-PK₁ cell lines

groups	Rh123 accumulation (nmole/mg protein)		
	PBS	E free	E supply
control	1.83637	3.01444	3.79286
RM 0.1 ng/ml	1.83698	4.09086	3.46951
RM 1 ng/ml	1.96660	4.84762	3.61824
RM 10 ng/ml	1.83978	4.75084	3.78572
verapamil 20 mcM	2.93307	4.01718	6.70978

Table 29 Results of RM on Rhodamine 123 accumulation in LLC-MDR₁ cell lines

groups	Rh123 accumulation (nmole/mg protein)		
	PBS	E free	E supply
control	0.746796	1.525837	0.792567
RM 0.1 ng/ml	0.704962	1.669672	0.684245
RM 1 ng/ml	0.739058	1.592272	0.838982
RM 10 ng/ml	0.818386	1.609871	0.718048
verapamil 20 mcM	1.337108	2.268001	1.782723

Table 30 Results MTT assay of co-treatment verapamil and RM 72 hours in LLC-PK₁ cell lines

RM concentration (ng/ml)	RM		RM+verapamil 20 μ M	
	%inhibition	S.E.	%inhibition	S.E.
0.0075	-6.13017	6.895217	-2.29563	9.067089
0.03	-6.79337	2.824697	0.205101	4.967236
0.122	-5.02387	3.41901	0.464837	4.175207
0.48	-0.15497	5.062892	2.035756	2.74536
1.95	3.572003	7.686176	15.07997	3.311947
7.81	19.84481	7.419547	69.49449	5.084906
31.25	70.24121	9.439254	88.44211	7.271882
125	95.50491	1.404096	96.66222	0.399227

Table 31 Results MTT assay of co-treatment verapamil and RM 72 hours in LLC-PK₁ cell lines

RM concentration (ng/ml)	RM		RM+verapamil 20 μ M	
	%inhibition	S.E.	%inhibition	S.E.
0.0075	8.698511	1.343145	-3.24975	7.853089
0.03	3.816879	3.340232	-1.87589	3.138606
0.122	13.37885	5.21797	24.70268	10.70113
0.48	40.10349	7.444389	78.31245	5.580601
1.95	82.24786	9.281349	95.82813	0.89625
7.81	95.12435	0.380866	95.88743	0.38486
31.25	97.24423	0.302592	97.25642	0.35737
125	96.58019	0.262763	96.74953	0.234875

Table 32 Results of RM co-treatment with verapamil on Rhodamine 123 accumulation in LLC-PK₁ cell lines

groups	Rh123 accumulation (nmole/mg protein)	
	PBS	E free
RM 0.01 ng/ml	5.0221124	4.0437302
RM 0.1 ng/ml	5.4535205	3.4831026
RM 1 ng/ml	6.4170452	3.8184327
verapamil 20 mcM	7.5940568	6.0674283

Table 33 Results of RM co-treatment with verapamil on Rhodamine 123 accumulation in LLC-MDR1₁ cell lines

groups	Rh123 accumulation (nmole/mg protein)	
	PBS	E free
RM 0.01 ng/ml	1.467927	2.030784
RM 0.1 ng/ml	1.76219	1.944276
RM 1 ng/ml	1.877291	2.134958
verapamil 20 mcM	2.01212	2.081233

VITA

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